AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions of the claims and all prior listings of the claims in the present application.

1. (currently amended) An apparatus for fetal monitoring, comprising:

a) means for determining processing circuitry configured to determine a fetal heart rate development over time[[,]];

b) means for processing circuitry configured to identify[[ing]] a primary fetal heart rate component[[,]];

c) means for processing circuitry configured to subtract[[ing]] the primary fetal heart rate component from the determined fetal heart rate development over time in order to determine a residual component; and

d) means for using said processing circuitry configured to use the residual component for analysis of [[the]] fetal heart rate beat-to-beat variation[[,]];

wherein the primary fetal heart rate component is identified through an polynomial curve fit approximation of data of the fetal heart rate [[data]] development over time, and by including:

[[(i)]] dividing the determined fetal heart rate development over time data into periods of time of [[a]] predetermined size; [[and]]

[[(ii)]] performing individual polynomial curve fit approximations of the fetal heart rate development over time data for each

period of time, each of the individual polynomial curve fit

approximations resulting in a polynomial curve; and

assembling the polynomial curves to form the primary fetal heart

rate component.

2. (currently amended) [[An]] The apparatus as claimed in of claim 1,

wherein said means for the processing circuitry configured to identify[[ing]] the

primary fetal heart rate component is adapted further configured to perform

the following steps:

[[(i)]] linear interpolation of recorded fetal heart rate development over

time data;

[[(ii)]] resampling at a resampling frequency, thereby forming a resampled

series of fetal heart rate data[[,]]; and[[;]]

[[(iii)]] individual polynomial curve fit approximations of [[said]] the

resampled series.

3. (currently amended) [[An]] The apparatus as claimed in of claim 1,

wherein the polynomial curve fit approximations utilises utilize polynomials of

at least the 5th order.

4. (currently amended) [[An]] The apparatus as claimed in of claim 3,

wherein [[said]] the polynomials are of the 5th order.

5. (currently amended) [[An]] The apparatus as claimed in of claim 3, wherein [[said]] the polynomials are of the 12th order.

6. (currently amended) [[An]] The apparatus as claimed in of claim 1, wherein the polynomial approximation of data of the fetal heart rate development over time is obtained through a least-squares approximation.

7. (currently amended) [[An]] The apparatus as claimed in of claim 1, wherein each individual polynomial curve fit approximation is constrained such that neighboring individual polynomial functions curve fit approximations align and have equal first derivatives at a border of the period of time border where the[[y]] individual polynomial curve fit approximations join.

8. (currently amended) [[An]] The apparatus as claimed in of claim 1, wherein the predetermined size is greater than or equal to a time corresponding to 20 consecutive heart rate samples.

9. (currently amended) [[An]] The apparatus as claimed in of claim 8, wherein the predetermined size is a time corresponding to 20 consecutive heart rate samples.

10. (currently amended) [[An]] The apparatus as claimed in of claim 1, wherein the means for using said processing circuitry configured to use the residual component for analysis of the fetal heart rate beat-to-beat variation is adapted further configured to apply statistical tests for analysing analyzing the residual component in order to determine [[the]] a response of [[the]] a fetus.

11. (currently amended) [[An]] The apparatus as claimed in of claim 10, wherein the statistical tests comprise[[s]] monitoring of a 95th percentile of the fetal heart rate residual component.

12. (currently amended) [[An]] The apparatus as claimed in of in claim 11, wherein the statistical tests further comprise[[s]] calculating a median and a variance of [[said]] the 95th percentile over a predetermined period of time.

13. (currently amended) [[An]] The apparatus as claimed in of claim 12, wherein [[said]] the predetermined period of time is longer than 10 minutes.

14. (currently amended) [[An]] The apparatus as claimed in of claim 12, wherein if the median of the 95th percentile is consistently below 3 milliseconds (ms) the fetal heart rate is classed as abnormal and non-reactive.

15. (currently amended) [[An]] The apparatus ~~as claimed in~~ of claim 12, wherein ~~said means for using said~~ the processing circuitry configured to use the residual component for analysis of the fetal heart rate beat-to-beat variation is ~~adapted~~ further configured to indicate a significant reduction of fetal reactivity, given a recording of the median of the 95th percentile below 2.3 milliseconds (ms) and the variance of the 95th percentile below 0.1 over an extended period of time.

16. (currently amended) [[An]] The apparatus ~~as claimed in~~ of claim 12, wherein ~~said means for using said~~ the processing circuitry configured to use the residual component for analysis of the fetal heart rate beat-to-beat variation is ~~adapted~~ further configured to indicate a significant reduction of fetal reactivity, given a recording of a decreasing trend of the median of the 95th percentile over an extended period of time.

17. (currently amended) [[An]] The apparatus ~~as claimed in~~ of claim 12, wherein ~~said means for using said~~ the processing circuitry configured to use the residual component for analysis of the fetal heart rate beat-to-beat variation is ~~adapted~~ further configured to exclude an abnormally low fetal heart rate variation if the median of the 95th percentile is consistently above 3 milliseconds (ms).

18. (currently amended) [[An]] The apparatus as claimed in of claim 10, wherein the statistical tests comprise[[s]] monitoring of a short term[[,]] e.g. 3-4 ms[[,]] frequency distribution of the fetal heart rate residual component.

19. (currently amended) [[An]] The apparatus as claimed in of claim 18, wherein if a 3-4 millisecond (ms) frequency distribution is less than 7%, the fetal heart rate is classified as non-reactive.

20. (currently amended) A method for fetal monitoring, the method comprising the steps of:

[[a)]] determining a fetal heart rate development [[rate]] over time[[,]];

[[b)]] identifying a primary fetal heart rate component[[,]];

[[c)]] subtracting the primary fetal heart rate component from the determined fetal heart rate development over time in order to determine a residual component; and

[[d)]] using [[said]] the residual component for analysis of [[the]] fetal heart rate beat-to-beat variation[[,]];

wherein the primary fetal heart rate component is identified through an polynomial curve fit approximation of data of the fetal heart rate [[data]] development over time, and by including:

[[(i)]] dividing the <u>determined</u> fetal heart rate <u>development over time</u>

data into periods of time of [[a]] predetermined size; [[and]]

[[(ii)]] performing individual polynomial <u>curve fit</u> approximations of

the fetal heart rate <u>development over time</u> data for each

period of time<u>, each of the individual polynomial curve fit</u>

<u>approximations resulting in a polynomial curve; and</u>

<u>assembling the polynomial curves to form the primary fetal heart</u>

<u>rate component</u>.

21. (previously presented) A computer ~~program~~ <u>readable medium</u>

<u>containing instructions</u> for executing the [[steps]] <u>method</u> of claim 20 ~~when the~~

~~programme is executed~~ in a programmable apparatus according to claim 1.